
M006: MOUNTAIN WALKING TECHNIQUES

TSP Number/Title	M006: Mountain Walking Techniques
Effective Date	Implement next class iteration upon receipt
Supersedes TSP(s)/Lessons	None
TSP User	The following courses use this TSP: Mountain Instructor Qualification Course (MIQC) Basic Mountaineering Course (BMC) Assault Climber Course (ACC)
Proponent	United States Army Alaska, Northern Warfare Training Center
Improvement Comments	Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: ATTN: TRAINING ADMINISTRATOR COMMANDANT USARAK NWTC 1060 GAFFNEY ROAD #9900 FORT WAINWRIGHT AK 99703-9900
Security Clearance/Access	Public domain
Foreign Disclosure Restrictions	The Lesson Developer in coordination with the USARAK NWTC foreign disclosure authority has reviewed this lesson. This lesson is releasable to foreign military students from all requesting foreign countries with Approval of Commandant USARAK NWTC.

PREFACE

Purpose This training support package provides the instructor with a standardized lesson plan for presenting instruction for:

Task Number	Task Title
VIII.0100	Mountain Walking Techniques

Technique of Delivery

Lesson Number	Instructional Strategy	Media
M006	Demonstration and Practical Exercise	None

This TSP contains

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SECTION I**ADMINISTRATIVE DATA****All courses including this lesson**

Course Number	Course Title
NA	Mountain Instructor Qualification Course
NA	Basic Mountaineering Course
NA	Assault Climber Course

Task(s) Taught or Supported

Task Number	Task Title
VIII.0100.A-J	Mountain Travel and Walking Techniques

Task(s) Reinforced

Task Number	Task Title
I.0200	Characteristics of Mountain Environments
III.0100	Clothing and Equipment for Cold Weather and Mountain Operations
VI.0200	Risk Management for Mountain Environments
VIII.0200	Mountaineering Equipment

Test Lesson Number

Hours	Lesson Number	Lesson Title
	M020/M021/M022	BMC Mountaineering Review/ACC Mountaineering Review/MIQC Mountaineering Review

Prerequisite Lesson(s)

-M001, Characteristics of Mountain Environments
-C003, Clothing and Equipment for Cold Weather and Mountain Operations
-C004 & M004, Cold Weather and Mountain Medical Considerations
-M005, Risk Management for Mountain Operations

References

Number	Title	Date	Additional Information
	NWTC Mountain Operations Manual	FY04	Updated yearly
FM 3-97.6	Mountain Operations	November 2000	http://www.adtdl.army.mil/
FM 3-97.61	Military Mountaineering	August 2002	http://www.adtdl.army.mil/

Student Study Assignment

Read TSP M006

Instructor Requirements

MIQC graduate; TAITC graduate

Additional Support Personnel Requirements

Two medics on movement route

Equipment Required

Instructor Equipment

- Mountaineering Helmet
- Rucksack
- Ice Ax

Student Equipment

- Mountaineering Helmet
 - Rucksack
 - Ice Ax
 - Pen and notepad
-

Materials Required**Instructor Materials:**

- NWTC Mountain Operations Manual
- Risk Management for Mountain Operations

Student Materials:

- NWTC Mountain Operations Manual
 - Risk Management for Mountain Operations
-

**Classroom,
Training Area and
Range
Requirements**

Mountaineering training/testing area large enough to facilitate 8 students and SGL. Training area must have adequate routes with hard packed, grassy, scree and talus slopes to facilitate simultaneous movement of 8 students.

**Ammunition
Requirements**

None

**Instructional
Guidance**

Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

**Branch Safety
Manager
Approval**

NAME	Rank	Position	Date
Mark Gilbertson	GS-09	Training Specialist	

**Proponent
Lesson Plan
Approvals**

NAME	Rank	Position	Date
Peter Smith	GS-12	Training Administrator	

M006: MOUNTAIN WALKING TECHNIQUES

SECTION II

INTRODUCTION

Method of instruction: Small Group
Type of instruction: Practical Exercise
Instructor to student ratio: 1:8
Time of instruction: 3 hours
Media used: None

Motivator

Efficient movement in mountainous terrain is a combination of physical fitness and correct technique. Soldiers accustomed to hard marches on flat terrain usually find themselves laboring on the trail when steep slopes are encountered. While physical fitness is all important, effective mountain walking is a skill developed over time, with practice, by applying certain techniques during movement which are alien to most. Though not obvious at first, correct mountain walking technique will increase the distance an individual, or unit, can cover in a given time period, while allowing personnel to arrive at the final objective more rested.

Terminal Learning Objective

ACTION:	Demonstrate knowledge of slope surface types, preparation for and execution of dismounted mountain movement, safe route selection, and a physical training plan for mountain operations
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 35 pounds, and complete climbing rack
STANDARD:	Demonstrate knowledge of slope surface types, preparation for and execution of dismounted mountain movement, safe route selection, and a physical training plan for mountain operations IAW this block of instruction.

Safety Requirements

Ensure that students:

- Receive a risk assessment prior to movement to the training area and before practical exercises.
- Have all necessary equipment for the PE's, to include any additional equipment required by the NWTC SOP.
- Have two full canteens and drink adequate water to avoid becoming dehydrated.
- Receive a briefing on the symptoms of heat injury or cold weather injury, as appropriate.

Risk Assessment Level

Determined by instructor

Environmental Considerations

None

Evaluation

You will be evaluated during mountain walking PT and during the Alpine FTX and during the mountain written test.

Instructional Lead-in

Operations in the mountains often involve small units moving by foot to objectives. Weather and terrain often preclude the use of wheeled vehicles or aviation assets. Techniques used on flat ground to road march do not translate to the mountains; using flat ground techniques can render a unit non-mission capable upon arrival at an objective. In this block of instruction, you will learn some techniques

that will assist you in route selection, hazard avoidance and movement over mountainous terrain in order to ensure that your unit arrives fit to fight.

SECTION III**PRESENTATION**

ELO A

ACTION:	Describe types of slope surfaces found in snow free mountainous terrain
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 35 pounds, and complete climbing rack
STANDARD:	Correctly describe the types of slopes found in snow free mountainous terrain IAW this block of instruction.

Learning Step/Activity 1 – Slope types in snow free mountainous terrain

a. There are 4 different types of slopes found in mountainous terrain

1. Hard Packed Slopes: Hard pack is considered earth, which will not give way under the weight of an individual. It usually consists of packed dirt or sand and may contain scattered rocks and vegetation.

2. Grassy Slopes: A grassy slope is seldom covered with a smooth carpet of grass. It normally is made up of small, grassy clumps, known as tussocks.

3. Talus Slopes: Rock fall from peaks, ridges and cliff bands is often canalized onto the lower slopes in large "fields", referred to as talus. A talus field are made up of rocks which usually do not move under feet, sizes may range from small, all the way up to large boulders.

4. Scree Slopes: Slopes comprised of the smallest rocks are called scree slopes. Scree varies in size from the smallest gravel to about the size of a man's fist. Like the larger talus, scree normally collects at the bases of ridges and cliff bands. The rocks that make up a scree field are generally uniform in size and act like sand or loose snow underfoot.

ELO B

ACTION:	Pack and prepare a rucksack for travel in mountainous terrain
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Correctly prepare a rucksack for travel in a mountainous terrain IAW this block of instruction.

Learning Step/Activity 1 – Pack a ruck sack for mountainous terrain

a. The first thing you must understand is that the optimal total load for a person has been determined to be 30% of his body weight. This translates to about a 50 lb. load for an average-sized person. The maximum load should not exceed 45% of the body weight, or about 70 lbs. for the average individual. This is often difficult to achieve for an extended mission in the mountains and planners must consider ways to reduce the load, such as ammunition, food and fuel re-supply points on movement routes. Soldiers that carry excessive loads will not be effective after long movements.

b. There are a few tricks to packing and carrying a heavy pack that will make life a bit easier during movement. First, pack "like items" together in separate nylon stuff sacks or plastic bags. Extra clothing is packed in one sack, food in another sack, mountaineering equipment in another, and so forth. Pack the lighter sacks in the bottom half of the pack. Place the heavier sacks in the upper half of the pack and towards the frame side where they will be closest to the body. If the pack has compression straps, snug them up tight to reduce the bulk of the pack and to keep the weight as close to the body as possible.

c. Hanging mountaineering equipment, fuel bottles, and the like on the outside of the pack is a very poor practice. Heavier items can be felt swinging with each step. These items will snag on brush,

make excessive noise, and may break or be lost in a tumble. When rock climbing, they will get caught on nubbins and in cracks and cause a loss of balance or a fall. Try to keep all items inside the pack until needed. Obviously, items like a machine gun tripod or the ice ax will usually be carried on the outside of the pack. Attach them in a secure manner where they will be least likely to create problems on the move.

d. The load should be carried on the hips and legs, not the shoulders. Tighten the waist-strap to a "very" snug fit, just above the bony portion of the hips. The pack should remain in place on the pelvic area without any help from the shoulder straps. Tighten the shoulder straps so the pack is snug against the body.

ELO C

ACTION:	Describe and demonstrate use of the ice ax in snow free mountainous terrain
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a pack rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Correctly describe and demonstrate the use of the ice ax in snow free mountainous terrain IAW this block of instruction.

Learning Step/Activity 1 – Using an ice axe in snow free mountainous terrain

The ice ax may be used as a third point of contact in difficult terrain. In rough country the ax in the pack snags so frequently on brush and tree limbs, it is better to be brought out into the open. Ice axes, like any edged tool, should be sharpened only to a degree appropriate for the intended use. An ax properly sharpened for climbing ice may be a hazard on the trail. At such times it is prudent to install an ax guard. If the ice ax is not being used at all, it should be carried on or in the pack with the head down, and well secured.

When the ax is carried in the hand on a good trail, the shaft is grasped at the balance point, with the spike forward and the head to the rear with the pick down. Thus the man behind is safeguarded against accidentally running into the spike, and the pick is less likely to do the owner harm in a fall. Even with care, the ice ax remains the most dangerous implement of mountaineering. When a Soldier becomes weary or footing is poor, he can use the ax for a cane. On steep slippery terrain, whether mud, grass, or snow, the ax is grasped by the head with the guard removed and the pick to the rear, in position for a quick arrest in the event of a fall.

On any terrain the mountain Soldier can find numerous unsuspected uses of the ax. When hopping over talus, it gives many individuals a slight "touch-and-go" balance point. On steep hillsides, just as on steep snow, the ax is held diagonally across the body, spike touching the slope, thus helping to hold a stable, vertical stance. Although the ice ax self arrest technique is primarily for use on snow, it may come in handy for arresting falls in steep meadows, forests, and loose dirt or scree.

ELO D

ACTION:	Demonstrate march discipline in snow free mountainous terrain
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate march discipline in snow free mountainous terrain IAW this block of instruction.

Learning Step/Activity 1 – March discipline in snow free mountainous terrain

a. March discipline in the mountains is the skillful control of pace and rest. The proper pace is a complex equation between the body's conditioning, the Soldier's load, the distance to be traveled, and the time available to complete the mission. There are several aspects to pace: first, is speed, or the number of steps taken during an hour; second, is the manner in which these steps are taken to conserve energy; third, is how frequently the unit should rest. The most common mistake of the beginner is walking too fast for the two departments of the body that control pace. A Soldier can only go as fast as his legs and lungs allow. When either component is overtaxed, a slowdown is required.

Speed fluctuates during the day. Start off slowly to warm up. Allow the body to become gradually aware of the demands being placed on it, until the familiar second wind takes over. Of critical importance is the short break or shakedown rest, soon after starting the movement to allow Soldiers to adjust clothing and equipment. The mountaineer should set a tempo, or number of steps per minute, according to the pace of the group in which he is moving. Physical differences, of course, mean that the tempos of two people moving at the same speed will not necessarily be the same. Soldiers should try to maintain this tempo and compensate for changes of slope or terrain by adjusting the length of stride, similar to an automobile driver downshifting gears to maintain engine RPMs when he starts up a hill. Tempo, pace, and rhythm are also enhanced when an interval of 3-5 paces is kept between individuals, tactical situation permitting. This interval will help to lessen the "accordion" effect of people at the end of the file constantly having to stop and start, sapping valuable energy.

b. Rests must be governed closely, and breaks should be kept to a minimum; indeed, when a slow enough pace is set, the need for breaks decreases, the chance of over-heating is lessened, and a group will usually cover a given distance in a shorter overall time than if it had set a faster pace. During the early part of the day, rests should be infrequent and short. Train Soldiers to remove the heavy pack during short breaks to rest the legs; remain standing so leg muscles don't have a chance to tighten up.

c. Walking above other individuals of a group can expose those individuals to rock fall generated by your movement. Close order movement can minimize this hazard by preventing any rocks that are dislodged from picking up much speed before they reach the next individual. Dislodging rocks is more likely on the descent and the same safety measures are taken as on the ascent; close order movement with no one descending directly above or below another in a traverse.

ELO E

ACTION:	Demonstrate fundamentals of mountain walking
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate the fundamentals of mountain walking on all 4 types of slopes correctly IAW this block of instruction.

Learning Step/Activity 1 – Fundamentals of Mountain Walking

a. The individual can increase the ease of movement over steep terrain in a variety of ways; there are however 3 mountain walking fundamentals that apply in all cases.

1. The weight should be centered directly over the feet at all times. This position provides maximum balance and support for the load. It also maintains stability between the foot and the slope. The chance of the foot slipping or the ground surface giving way underfoot is reduced.

2. The foot should be placed flat on the ground to obtain as much boot, (sole), ground contact as possible. Along with correct weight distribution, this "flat-foot" technique places the workload on the larger thigh muscles and prevents the lower leg muscles (calves) from overworking.

3. The trailing knee can be locked after each step. This technique, called the "rest-step", allows body weight, and the load, to be supported by the leg bones between each step. The leg muscles get a momentary rest which, though brief in duration, greatly reduces energy expenditure over the long haul.

b. The descent is where the majority of all mountaineering accidents occur. When descending any terrain, it's easy to let the desire to reach home take over, leading to improper technique, which could cause falls and injuries. This is how the majority of knee and ankle injuries are caused. The individual's body weight and load drop abruptly on the knee and ankle joints. The foot tends to jam forward into the toe of the boot creating "hot spots" and blisters. It's a good idea to change socks prior to the descent, maybe putting on an additional pair for increased cushioning and to help prevent the foot from sliding around in the boot. Tightening the boot laces a bit more than normal will also help keep the foot in place, however don't overdo it and cut off circulation in the foot.

c. Rate of descent should be kept at a controllable, set pace. The upper body should be kept erect to maintain balance. Knees should remain flexed at all times to absorb shock. Descent is usually straight down the fall line on gentle to moderate slopes. It's often best to traverse the steepest slopes to prevent building up too much speed.

ELO F

ACTION:	Demonstrate techniques of ascending/descending hard packed and grassy slopes
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate the techniques of ascending/descending hard packed slopes IAW this block of instruction.

Learning Step/Activity 1 – Techniques for hardpack slopes

a. On gentle portions of the slope, the individual can walk straight up the hill. As the slope increases, a "herringbone step" is used to maintain balance and the flat-foot technique. The toes are pointed outward while movement is straight forward. On the steepest slopes, a "switch back" or traverse technique is used. The steep angle of the slope is reduced by traversing the slope in a "zigzag" pattern. The ankles can be rolled downhill to maintain good sole-ground contact. This can sometimes strain the ankle joints, especially if the individual is carrying a heavy load. More often, it's best to point the uphill foot in the direction of travel and the downhill foot at a comfortable downhill angle to maintain the flat-foot technique. The ice ax can be used in the cane position on the uphill side to assist with balance.

b. A loss of balance may occur if the legs are crossed in the traverse. To avoid this, step off with the uphill foot when changing directions. Maintain balance by keeping the weight centered over the feet. Avoid the natural tendency to lean into the slope. The ice ax can be used in the port-arms, or cross body, position, with the spike on the uphill side, as a third point of contact to help maintain the center of balance. An additional energy saving move would be to step around or over obstacles in the path, such as fallen timber and boulders, rather than on top of them. Stepping onto and off of objects increases the workload on the legs.

Learning Step/Activity 2 – Techniques for grassy slopes

a. Techniques for ascending and descending a grassy slope are the same as for hard pack. Tussocks can be bypassed or used as "steps" during the ascent. Step on the uphill side of each tussock where the underlying earth and tussock will support your weight.

ELO G

ACTION:	Demonstrate techniques of ascending/descending scree slopes
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate the techniques of ascending/descending scree slopes IAW this block of instruction.

Learning Step/Activity 2 – Techniques for scree slopes

a. The rocks on a scree slope tend to break away from the slope in small, minor slides with each step. Ascending scree can be very tiring and is usually avoided. A scree field is often traversed across to get to a more stable slope. Steps often have to be kicked into scree to create a more stable platform for the feet. If the scree is continually breaking away underfoot, try and "hop" uphill with each step to maintain elevation. If additional switchbacks are made, personnel should stay close together and the entire group should complete a traverse before starting another. Again, no one should climb directly above another because of the rock fall hazard. The ice ax can be very beneficial as a third point of contact on scree. Again, it is used in the "port-arms" position, with the spike on the uphill side to help maintain balance.

b. While talus is preferred over scree as an ascent route, scree fields often make the best routes of descent. If the slope is steep enough, "screeing" is a technique which is both timesaving and energy efficient. Screeing is like skiing, or glissading on snow. The feet are shuffled along allowing the small rocks to break away and pile up underfoot. The individual tries to keep his momentum going and "ride" the descending rock pile in a standing glissade position. The ice ax can be a big help here in maintaining balance when the feet want to come out from underneath you. Again, use it in the port-arms position with the spike on the uphill side. The minor rockslides that develop from screeing are usually not much of a hazard as long as personnel stay close together, one right behind another. Ensure that the bottom of the slope is visible and no hazards exist.

ELO H

ACTION:	Demonstrate techniques of ascending/descending talus slopes
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate the techniques of ascending/descending talus slopes IAW this block of instruction.

Learning Step/Activity 1 – Techniques for talus slopes

a. Generally talus is a fairly easy ascent route. Like a grassy slope, the rocks can be used like a staircase. Pick out rocks with the smoothest tops and step on the uphill sides to avoid kicking them loose. Sometimes larger rocks are held in place by smaller "key stones". Dislodging one of these key stones may tip the balance causing the larger rocks to break loose, possibly creating a dangerous rock slide. Be aware of this potential hazard and avoid talus fields that feel unstable underfoot. When ascending, keep personnel at close order, one right behind another. Rocks that are dislodged can be halted or directed away by the group before they have a chance to build up speed and momentum. When traversing, allow all personnel to complete a switchback before starting another. This prevents personnel at the head of the group from climbing directly above trailing individuals, who would otherwise be in the direct path of any rocks kicked loose by those above. Talus slopes must be descended with caution. The force placed on the rocks by the individual will be much greater during the descent, increasing the likelihood of rock fall. Descent should be slowed and steps taken very carefully. Large talus fields are normally avoided for the descent.

ELO I

ACTION:	Demonstrate the proper route selection and utilize proper movement technique to manage risks associated with mountain travel
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a packed rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Demonstrate the proper route selection and utilize proper movement technique to manage risks associated with mountain travel IAW this block of instruction.

Learning Activity/Step 1 – Route selection

a. Route finding involves locating a route within the limitations of the party. Along with hazard evaluation, it is the most important aspect of movement in the mountains. Choosing a route, whether for mountain walking, balance climbing, movement across a glacier or any type of movement in mountains, is critical to successful mountain operations. The route selection must be based on many items, including:

1. Obviously the easiest terrain should be considered when the enemy threat is low. More difficult terrain may be the optimum choice when the enemy threat is high, because it will be the route with the least enemy direct/indirect coverage (making the assumption that the enemy has left it relatively unprotected due to the difficult nature of the terrain). Map reconnaissance may give some insight, but in general actual route reconnaissance is preferred as mountain terrain is difficult to appreciate from a map. A suitable route on a map may have obstacles that are non-negotiable in actuality. Consider the type of terrain, the condition of personnel (level of mountain training, experience and fitness), the size of unit that the route will be able to support (usually smaller self-sufficient units on multiple routes is preferable to a large unit on a major avenue of approach). Re-supply and casualty evacuation must also be considered. Air insertion should be never be the only method of infiltration/exfiltration, re-

supply and medical evacuation. Weather and objective hazards along the route also need to be considered.

b. Most of the mountain walking techniques described are designed to minimize the most common mountaineering hazard, rockfall. During training, if a rock is kicked loose, or rocks let loose from upper slopes, the warning "ROCK" should be shouted and repeated by everyone. If you are within a few feet of protective cover, get behind it and protect the face and head. If directly below steep cliffs, DO NOT look up. Immediately lean into the rock, again, protecting the face and head as much as possible. Lacking any cover, try to anticipate which way the rock will go and move right or left of its path. DO NOT run away downhill. If you are directly in the path of rockfall, and don't have time to get out of the way, minimize your exposure by lying flat on the ground, protecting your face and head. What might have been a "direct hit" could miss you entirely if you hit the ground quickly.

ELO J

ACTION:	Develop a physical training plan for mountain operations
CONDITION:	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a pack rucksack with approximately 50 pounds, and complete climbing rack
STANDARD:	Develop a physical training plan for mountain operations IAW this block of instruction.

Learning Activity/Step 1 – Develop a physical training plan for mountain operations

a. Sustained training with far less than maximum loads is a proven contributor to combat readiness. The idea that training with heavier loads somehow will increase a Soldier's combat readiness is as silly as thinking that bleeding during training will increase his ability to withstand battlefield wounds. Train with 35-50 pounds maximum. In general, the Army PT program and the road march standard of 12 miles in 3 hours DOES NOT translate well to mountain operations. Soldiers need to move up and down difficult terrain with moderate loads to become accustomed to moving in mountainous terrain. This includes developing balance, confidence, and muscular endurance that allows Soldiers to get to the objective with enough energy to execute the mission. Weight training is also important to strengthen tendons, ligaments and muscles in order to prevent injury.

b. Operating in the mountains is undoubtedly one of the most demanding activities, both mentally and physically, that the average Soldier ever engages in. Add altitude to the mountain equation and you have the strong possibility of losing combat power to environmental injuries. Any physical activity is most easily performed by a body in good condition from frequent exercise. The best exercise for getting in shape for mountain travel is mountain travel itself. Frequent training exercises in the mountains will strengthen the leg muscles and develop stamina, while at the same time reinforce correct mountain walking technique. From a physical fitness standpoint, training in the mountains often cannot be performed frequently enough to gain any real benefit from the exercise. In such cases, a training program should be implemented that emphasizes development of leg muscles and cardiovascular endurance. The muscles that are most important to climbing are those of the legs, which carry the load and take the pounding. The thigh muscles (quadriceps) and hamstrings are the ones that will be worked the most.

c. Training should concentrate on developing strength in these upper leg muscles. Good exercises for this are squats, the leg press, deadlifts, lunges, knee benders, and walking up and down flights of stairs or using *stairmaster* type exercise machines. Running, bicycling, and jumping rope not only work the legs, but also build stamina required for mountain travel. Any aerobic type exercise is beneficial for increasing endurance. Swimming is excellent, however it must be performed along with exercises that toughen the leg muscles for the loads and the pounding.

d. Of secondary importance is strengthening of the upper body. When the pack is fitted and worn correctly, the weight will be on the hips, but shouldering a heavy pack, steep rock and ice climbing, and movement on various rope installations all require a certain degree of arm and hand strength. Exercises should emphasize pulling exercises for developing the arm and back muscles used most in climbing. Core body exercises are also important as the climbing becomes more technical. A few pushing exercises should be chosen to balance the overall training program.

Learning Step/Activity 2 – Sample Training Program

a. Two sample physical training programs are listed below; one for a unit with six months to train, one

for a unit with three months to train. It gives an idea of the level of fitness that Soldiers operating in the mountains should strive for. The Army PT program provides a good base for Soldiers, but it is the mountain specific training outlined in this program that will be a combat multiplier when operating in mountainous terrain. Units with other pre-deployment demands should make every effort to meet the guidelines outlined in this training program. It should also be noted that upon deployment this training should not stop. Squad and team leaders may need to become creative with training, but there should be ample time in a day to find time to fit in mountain specific physical training.

b. Six month program:

1. Month 1:

- a. Aerobic training 4 day per week – 30 minutes per session minimum
- b. Strength training 3 days per week – focus on large muscle movements for arms, shoulders, back, legs and abdominals. Larger muscle movements such as squats, lunges, rows and dead lifts are excellent exercises. Three sets per exercise, 8-15 reps per set. Aim for muscle failure in third set.

Aerobic training should focus on running or road marches preferably on hilly terrain. Rucksacks should weigh no more than 50 pounds. Ski and/or snowshoe movements are also appropriate.

2. Month 2:

- a. Aerobic training 4 days per week – 40 minutes per session minimum
- b. Strength training 3 days per week - same focus as month 1.

3. Month 3:

- a. Aerobic training 5 days per week – 45 minutes per session minimum; include at least 2 hill climbs per week
- b. Strength training 4 days per week – same focus ; add one day

4. Month 4:

- a. Aerobic training 5 days per week – 50 minutes per session minimum; include three hill climbs per week, focus on long movements in hilly terrain with a 50 pound rucksack. Begin to conduct long movements (2-6 hours) over rough or hilly terrain.
- b. Strength training – 4 days per week; three sets per exercise, increase weight and decrease repetitions

5. Month 5:

- a. Aerobic training 5 days per week – one hour per session minimum; long movements with a 50 pound rucksack should become the norm (up to eight hours of movement)
- b. Strength training 4 days per week – same focus

6. Month 6:

- a. Aerobic training 5 days per week – one hour per session minimum; continue with long movements
- b. Strength training 4 days per week – shift all strength training to less weight, higher repetitions and avoid going to failure.

c. Three month program:

1. Month 1:

- a. Aerobic training 4 days per week – 45 minutes per session minimum. Aerobic training should focus on running or road marches preferably on hilly terrain. Rucksacks should weigh no more than 50 pounds. Ski and/or snowshoe movements are also appropriate.
- b. Strength training 3 days per week - focus on large muscle movements for arms, shoulders, back, legs and abdominals. Larger muscle movements such as squats, lunges, rows and dead lifts are excellent exercises. Three sets per exercise, 8-15 reps per set. Aim for muscle failure in third set.

2. Month 2:

- a. Aerobic training 5 days per week - 50 minutes per session minimum; include three hill climbs per week, focus on long movements in hilly terrain with a 50 pound rucksack. Begin to conduct long movements (2-6 hours) over rough or hilly terrain.
- b. Strength training – 4 days per week; three sets per exercise, increase weight and decrease

repetitions.

3. Month 3:

- a. Aerobic training 5 days per week – one hour per session minimum; continue with long movements
- b. Strength training 4 days per week – shift all strength training to less weight, higher repetitions and avoid going to failure.

SECTION IV**SUMMARY**

- Check on Learning**
- a. What are the three fundamentals of mountain walking?
Maximum foot to ground contact, weight centered over the feet and the rest step.
 - b. What slope type should be avoided during a descent?
Talus slopes
 - c. What type of slope should be avoided for an ascent?
Scree slopes

Review and Summarize Lesson	ACTION	Demonstrate knowledge of slope surface types, preparation for and execution of dismounted mountain movement, safe route selection, and a physical training plan for mountain operations
	CONDITION	In a field environment, given multiple pitches on 1 st through 5 th class terrain, a pack rucksack with approximately 50 pounds, and complete climbing rack
	STANDARD	Demonstrate knowledge of slope surface types, preparation for and execution of dismounted mountain movement, safe route selection, and a physical training plan for mountain operations IAW this block of instruction.

Transition to next lesson As per NWTC training schedule; dependent upon course in conduct.

SECTION V**STUDENT EVALUATION**

**Testing
Requirements**

Information covered in this lesson may appear on the end of course written examination.

You will be evaluated on performance of mountain walking techniques during mountain walking PT and the FTX. On the spot corrections will be made by the instructors.

**Feedback
Requirement**

Students will receive two opportunities to pass each event tested. Re-training will be conducted for students that fail the first iteration of testing. Refer to M020 for specifics.
